of Clinical Chemistry) has also set out to develop an HbA1c reference method and primary reference materials. As it turns out, the IFCC values are lower than NGSP values. For example, a 7.0 NGSP = 5.3 IFCC. There is a formula that can be used to convert between the two, but this makes it more difficult to accurately determine a patient's glycemic control. Although the guidelines may be changing in the future, a consensus has not been reached at this time. It is therefore important that clinicians continue to follow their current guidelines for HbA1c when monitoring their patients.

Screening in Pediatric Diabetes

Pediatric diabetes patients should be screened for celiac disease, thyroid disease, dyslipidemia and microalbuminuria when certain indications are present. These diseases are all serious and can effect the treatment of diabetes. Diabetes may also mask their presence and complicate their effects.

Celiac diseases

In type 1 diabetics (T1D), celiac disease (CD) causes unexplained hypoglycemia. Up to 16% of T1D patients develop autoantibodies to tissue transglutinase (TG IgA), a marker of CD. 70-90% of T1D patients have a positive intestinal biopsy for CD (Rewers et al. 2004).

Marian Rewers, MD, University of Colorado Medical Center, Denver, CO, recommends that T1D patients be screened for TG IgA at onset of diabetes and at least bi-annually until age 10, or if symptomatic. In symptomatic cases, a biopsy should be recommended. All patients whose CD biopsy was positive should be put on a gluten-free diet, regardless of symptoms. A patient's insulin dose usually needs to be increased when he/she is on a gluten-free diet.

Thyroid disease

15-30% of patients with type 1 diabetes have hypothyroidism. The coexistence of T1DM and autoimmune thyroid disease (AITD) is considered autoimmune polyglandular syndrome (APS Type III), explained Linda DiMeglio, MD, MPh, Riley Hospital for Children, Indianapolis, IN. Autoimmune thyroiditis is associated with human leukocyte antigen [HLA] genotype as well, which may be synergistic with HLA type for development of both T1DM and TAI.

"It is important to know the thyroid status of patients with T1DM because untreated hypothyroidism results in reduced insulin degradation and could cause hypoglycemia," said Dr. DiMeglio.

Hyperthyroidism affects only one percent of those with T1D, with Graves' disease being the most common cause of hyperthyroidism in young children and adults. Hyperthyroidism can be associated with worsening glycemic control and thyrotoxicosis may reveal latent diabetes mellitus.

Serum thyroid stimulation hormone (TSH) is the most reliable and sensitive screening test for thyroid dysfunction.

Lipid Profiles

Dyslipidemia in childhood is a risk factor for development of atherosclerosis and increased cardiovascular (CV) risk. The goals of identifying and treating dyslipidemia are to prevent or delay atherosclerosis and to diminish CV risk associated with diabetes and dyslipidemia (*NEJM* 1998).

The ADA recommends performing a lipid profile after diagnosis of diabetes in children over age 2 years, and when glucose control has been established. If values are considered low risk and there is no family history, assessments should be repeated every 5 years.

"The primary goals of lipid screening in children and adolescents are to identify abnormalities, intervene and diminish CV risk," explained Kenneth Jones, MD, University of California, San Diego. "Diabetes and dyslipidemia contribute to the acceleration of atherosclerosis and increase CV risk, and this process begins in childhood."

Many young individuals with obesity and T2 diabetes have the dyslipidemia of insulin resistance, with its attendant risks. The treatment of familial hypercholesterolemia (FHC) with statins is safe and efficient and improves signs of vascular injury (*Lancet* 2004), according to Dr. Jones.

"There is a pressing need to identify lipid abnormalities in young people and study the safety and benefits of intervention," he concluded.

Microalbuminuria

Risk factors for microalbuminuria (MA) are early onset of diabetes, long duration of diabetes, poor glycemic control, family history of nephropathy, smoking, autonomic neuropathy or retinopathy, poor diet, lack of exercise and hyperlipidemia. A rise in BP (hypertension) does not precede MA.

"Those who develop T1D before puberty appear to be in a latent period followed by more rapid development of MA with pubertal onset," explained Denis Daneman, MD, Hospital for Sick Children, Toronto, Canada.

According to Dr. Daneman, extrapolations from adult and adolescent studies may be misleading, which indicate that studies of natural history of diabetes-related complications starting in pre-pubescent children are warranted.

These four complications can all affect the outcome of diabetes treatment and care, and should be screened in pediatric diabetes patients, according to guidelines developed by ADA and other organizations, in order to avoid further complications.

Clinical Inertia Leads to Inadequate Treatment of Hypertension and Hyperglycemia

Four independent studies have shown that doctors are failing to intensify therapy in people with type 2 diabetes and high blood glucose levels or high blood pressure. Physicians do not appear to be aware of the American Diabetes Association guidelines or choose not to follow them because, in the populations we studied, the antihypertensive regimen was intensified in only 26 percent of visits in which the individuals had elevated blood pressure," said Alexander Turchin, MD, MS, Brigham and Women's Hospital and Harvard Medical School, Boston, MA.

Other studies identified failure to intensify treatment to maintain blood glucose levels at the recommended A1C goal of less than 7%, and delay in therapy intensification for those on oral anti-diabetic drugs on average until A1C was 8.5%.